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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,476	09/15/2003	Marc Ferrato	Q77425	9244

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EXAMINER

BAREFORD, KATHERINE A

ART UNIT PAPER NUMBER

1762

DATE MAILED: 07/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/661,476

Applicant(s)

FERRATO ET AL.

Examiner

Katherine A. Bareford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

The amendment of June 6, 2005 has been received and entered.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

New claim 11 requires that the "substrate obtained by spraying said powder onto said support is an electric bus". However, this amendment is new matter. The only place in the specification where a description of the formation of "electric buses" occurs is in the "Description of the prior art", at page 1, lines 10-20. However, this description does not indicate that the AlN substrate forms an "electric bus", but rather that the "electrically insulative" AlN substrates form supports for "powder electronic components", which would include electric buses, which would be electrically conductive. Therefore, it appears that this section of the substrate describes the desire

to form a support for an electric bus from AlN. Note Japan 2000-49257 which describes using AlN as a substrate support (1) for a bus (3).

3. Claims 1-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In claim 1, as amended, it is required that "said substrate obtained by spraying said powder onto said support has a thickness of from 0.1 to 0.5 mm". This is described at page 6, lines 5-10 of the specification. However, one of ordinary skill in the art cannot determine from a reading of the claim or the specification as to whether the referred to thickness refers to the thickness of the applied AlN layer alone or to the thickness of the combination of the AlN layer and the support. The specification does not provide any indication of the thickness of the support and/or whether it remains with the AlN layer and is considered part of the support. As a result, it would require undue experimentation for one of ordinary skill in the art to determine what thicknesses are actually acceptable by testing all thicknesses with and without a support to determine what is the minimum and maximum thickness of the AlN and the support.

4. The rejection of claims 1-10 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention is withdrawn due to applicant's amendments to the claims to remove the described issues on June 6, 2005.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schultze et al (US 4460529) in view of Knudsen et al (US 5273699).

Schultze teaches a method of fabricating a substrate that can be an aluminum nitride substrate. Column 1, lines 60-68 and column 2, lines 40-55. The substrate is

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obtained by spraying a powder onto a support at a high temperature and a high speed. Column 2, line 40 through column 3, line 40 (the plasma spraying). The powder can include AlN grains. Column 2, lines 40-55. Schultze teaches that the process can replace conventional processes such as dry pressing, wet extrusion, slip molding, isostatic pressing, hot pressing, and injection pressing, whereby a ceramic powder is processed and then undergoes high temperature sintering. Column 1, lines 15-35. As to the thickness of the substrate formed, Schultze teaches that the thickness of AlN formed can be 0.05 to 0.15 mm (0.15 mm is within the claimed range, for example) and that the support can be separated from the Al N layer, thus providing that the substrate formed can have a thickness of 0.15 mm, for example. See column 3, lines 20-30, column 4, lines 35-40 and column 5, lines 1-22.

Claim 2: the powder can be sprayed by a plasma torch (plasma spraying).

Column 3, lines 15-30.

Claim 8: the substrate can be obtained by providing a plurality of passes over the support as a function of the required thickness. Column 5, lines 20-30.

Claim 10: the substrate can be heated after spraying, thus providing the "annealing". Column 4, lines 55-60.

Schultze teaches all the features of these claims except (1) the use of the oxide precursor, (2) spraying with an oxyacetylene torch (claim 3), (3) the specific formation of the powder and the materials used (claims 4-7).

However, Knudsen teaches a method of forming an aluminum nitride powder. Abstract. Knudsen teaches that it is desirable to make the powder moisture resistant by treating with a yttrium containing compound, thus preventing storage problems for the powder. Column 2, lines 5-20 and 35-45. The yttrium compound can be an rare earth oxide precursor, such as yttrium isopropoxide. Column 3, lines 10-20. The compound can be applied to the aluminum nitride powder by (1) dissolving the yttrium compound in an organic solvent forming a solution, (2) then dispersing fine pure AlN powder in the solution with vigorous agitation to form a suspension, (3) then atomizing the suspension in an inert atmosphere (vacuum, for example) to obtain the treated powder. Column 3, line 15 through column 4, line 10 and column 5, line 65 through column 6, line 10. The treated powder can contain yttrium oxide in an amount of 0.1 to 10 % by weight of the aluminum nitride. Column 3, lines 5-15. The solvent can be isopropanol (which would be form of propanol). Column 3, lines 45-50.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Schultze to use the treated aluminum nitride powder as taught by Knudsen, in order to provide a desirable substrate using a moisture resistant powder, because Schultze teaches the desire to form aluminum nitride articles by plasma spraying aluminum nitride powder, and Knudsen teaches that a desirable moisture resistant aluminum nitride powder can be formed by treating with yttrium oxide precursor. It would have been inherent when plasma spraying such a powder that the oxide precursor would have yielded an oxide, given the high heat of the plasma

spraying. It would further have been obvious to modify Schultze in view of Knudsen to use a flame spraying oxyacetylene torch to replace the plasma torch with an expectation of desirable spraying results, because Schultze teaches thermal spraying and it is the Examiner's position that it is well known in the thermal spraying art that plasma and flame spraying with an oxyacetylene torch are both well known desirable methods of thermal spraying. It would further have been obvious to modify Schultze in view of Knudsen to perform routine experimentation to optimize the amount of yttrium oxide content from the range taught by Knudsen of 0.1 to 10% by weight, given the desire to use the best amount for the particular purpose of applicant. It would further have been obvious to modify Schultze in view of Knudsen to use yttrium isopropionate as the oxide precursor, with an expectation of desirable protective results, because Knudsen teaches the use of yttrium compounds that convert to oxides (column 3, lines 10-20) and it is the Examiner's position that isopropionates are well known oxide precursor compounds in the chemical art.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schultze in view of Knudsen as applied to claims 1-8 and 10 above, and further in view of Okano et al (US 5045365).

Schultze in view of Knudsen teaches all the features of this claim except the cooling of the support by compressed air while spraying. Schultze does teach that the support can be metal. Column 4, lines 20-35. Schultze also teaches cooling the support

during spraying. Column 2, line 65 through column 3, line 5 and column 3, line 65 through column 4, line 10.

However, Okano teaches that when coating an article to be thermally sprayed, the conventional method is to spray compressed air on the back of the substrate surface. Column 3, lines 1-20.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Schultze in view of Knudsen to use compressed air for cooling as taught by Okano, in order to provide a desirable cooling of the substrate without having to use liquid, because Schultze the thermal spraying of a cooled support, and Okano teaches that when thermal spraying a cooled support, a conventional well known method of cooling is by compressed air.

9. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schultze in view of Knudsen as applied to claims 1-8 and 10 above, and further in view of Dittrich et al (US 3617358).

Schultze in view of Knudsen teaches all the features of these claims except the particle formation features and particle sizes.

However, Dittrich teaches making flame spray powders where finely divided material is suspended in liquid, the suspension is atomized and the atomized suspension is dried to form a flame spray powder. Column 1, line 75 through column 2, lines 10. The initial particle sizes can be between 1 and 15 microns. See column 2, lines

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5-10 and column 3, lines 40-45. For example, the particle size can be approximately 3 microns. Column 17, lines 60-70. After the atomization and drying, the formed particles can be formed with diameters in the range of 140 mesh to 325 mesh (106 to 45 microns). Column 18, lines 30-45, for example. The formed powder is then screened to use particles of the desired size for spraying, such as 200-325 mesh (75-45 microns). Column 18, lines 55-60. The particles formed can also be hollow. Column 19, lines 5-15.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Schultze in view of Knudsen to use initial and final particle sizes, and to use hollow spheres as taught by Dittrich, in order to provide a thermal spray powder, because Schultze in view of Knudsen teaches the thermal spraying of formed AlN powders, with Knudsen teaching a liquid dispersion and spray atomization to form AlN powders, and Dittrich teaches to form liquid dispersions of particles and spray atomize to form thermal spray powders, and that when doing so it is desirable to start with fine powders, such as in the 3 micron size range, which are agglomerated by the spray atomization and drying to form larger particles, such as 45-106 micron in size range, and to further screen the powder to the size desired for thermal spraying. Dittrich further teaches that hollow spheres can be formed, and it would have been obvious to one of ordinary skill in the art that such hollow spheres would also be screened as desired to form a specific coating, given the teaching of Dittrich to screen formed powders to get those desired for thermal spraying.

Response to Arguments

10. Applicant's arguments filed June 6, 2005 have been fully considered but they are not persuasive.

Applicant argues that the cited references do not disclose the thickness range of 0.1 to 0.5 mm, as is now claimed. Applicant argues that Schultze teaches away from the claimed thickness because it teaches that the invention is especially suited for pipes having a wall thickness greater than 5 mm.

The Examiner has reviewed this argument, however, the rejection is maintained. While Schultze teaches that the invention can be used to produce pipes with a wall thickness greater than 5 mm, the invention is not limited to thickness that great. As taught at claim 3, lines 15-30, a thickness of 0.05 to 0.15 mm (within the claimed range) can be formed. Since the support can be separated from the formed layer, the resulting substrate thickness formed can be 0.05 to 0.15 mm (see column 4, lines 35-60). It is clear that thicknesses in the range of 0.05 to 0.15 mm are contemplated, because claim 2 of Schultze, which depends on claim 1, specifically claims that the thickness of the layer is 0.05 to 0.15 mm. See column 5, lines 15-25.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.


Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KATHERINE BAREFORD
PRIMARY EXAMINER